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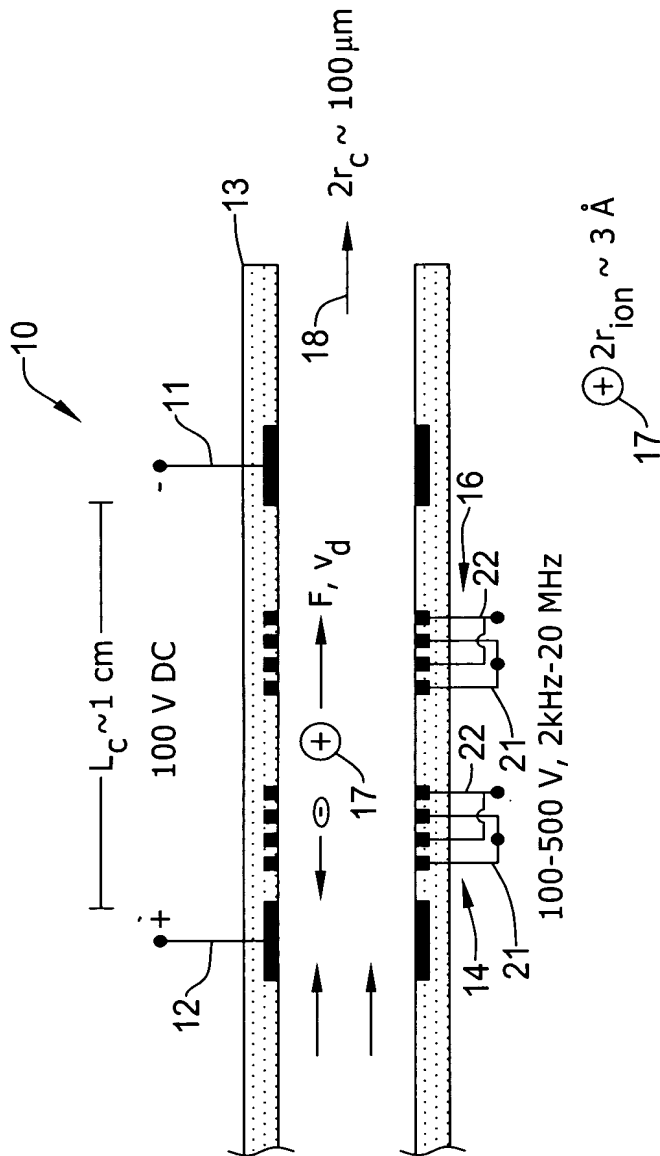


Figure 1



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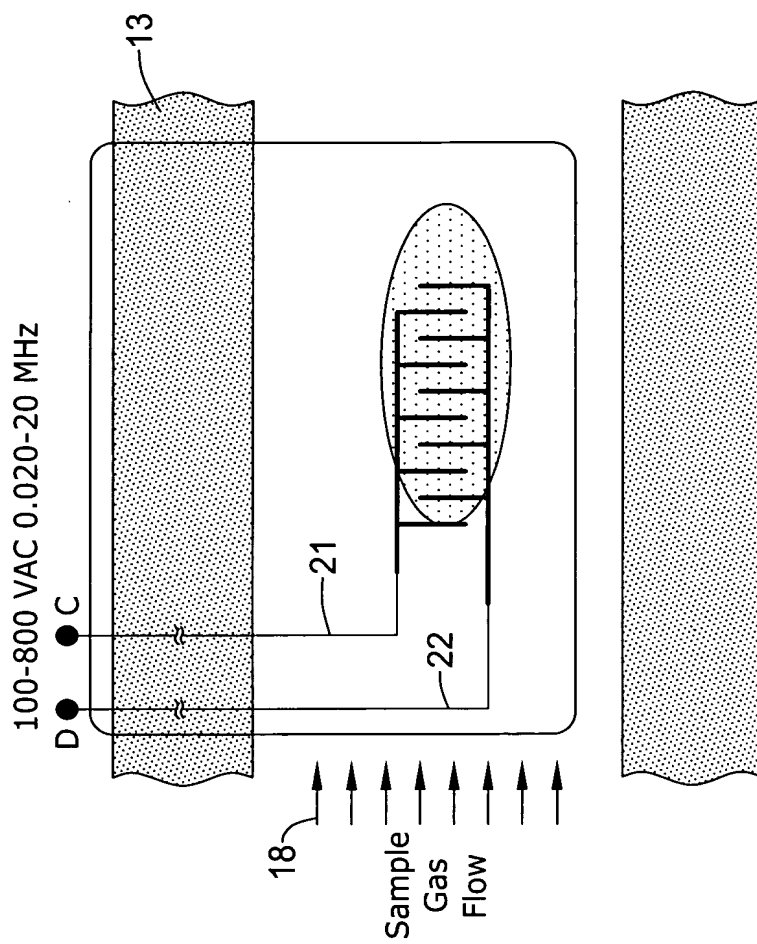


Figure 3

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↙

Element	Electron Affinity (kJ/mol)	Electron Configuration	Ionization Energies (kJ/mole)
H	72.8	1s ¹	1300
He	<0	1s ²	2400
Li	59.8	[He] 2s ¹	
Be	<0	[He] 2s ²	
B	27	[He] 2s ² 2p ¹	
C	122.3	[He] 2s ² 2p ²	1050
N	<0	[He] 2s ² 2p ³	
O	141.1	[He] 2s ² 2p ⁴	
F	328.0	[He] 2s ² 2p ⁵	1300
Ne	<0	[He] 2s ² 2p ⁶	

Figure 4

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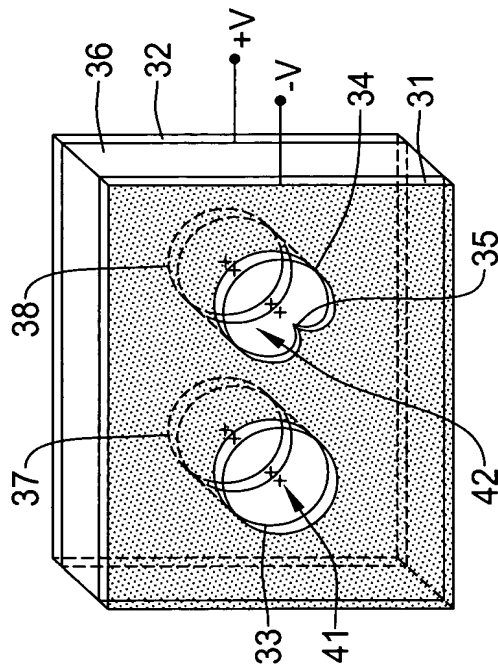


Figure 5

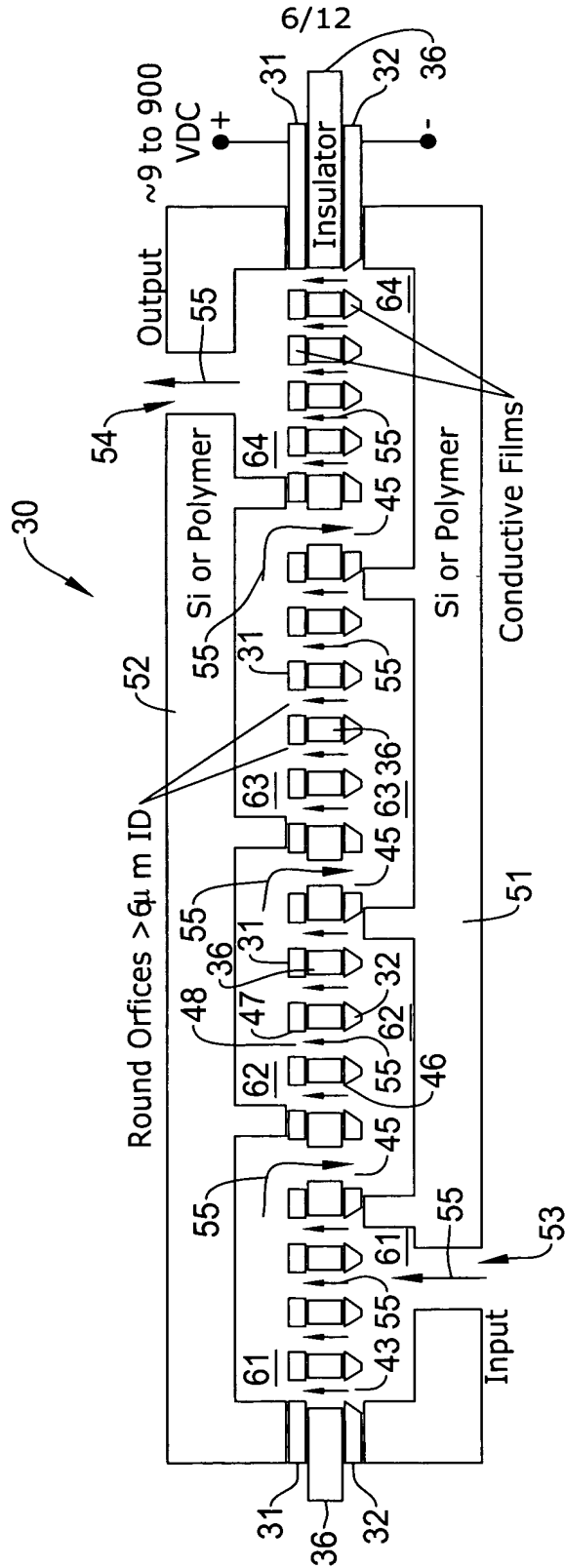


Figure 6

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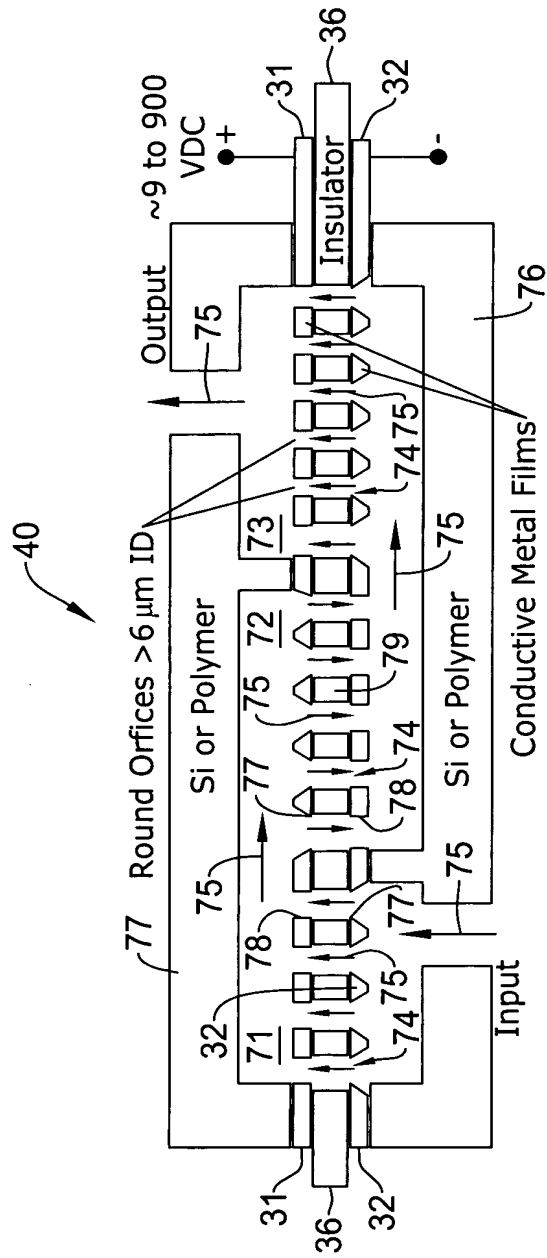


Figure 7

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Comparison of Performance Between Pumps Based on Different Technologies

Method	Base Unit Size x N mm3	Frequency Hz	Power mW	Voltage V	Flow Rate cm3/min	ΔP psid
Theoretical Ion Drag	-	DC	1.26	1.41	9.7	
	10 x 0.25 x 1 = 2.5	DC	1.65	401.41	9.7	
MesoPump (el.-static, future)	5x5x0.5x15 = 188	25	14	100	1.0	10
MesoPump (el.-static, today)	10x10x1x50 = 5000	3	25	150	1.0	10
MesoPump (el.-static, today)	10x10x1x50 = 5000	3	25	150	1.0	10
Piezo-Electric (fraunhofer)	7x7x1.1x7x14 = 5282	100		98		

Figure 8

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Temperature Dependence of Ion Concentration

Temper. T in K	Ion Aff. Energy E(-) in J/mol	Ionizat. Energy E(+) in J/mol
	100,000 exp(-E/RT)	1,000,000 exp(-E/RT)
600	2.239E-09	3.169E-87
1500	3.468E-04	2.514E-35
2000	2.541E-03	1.123E-26
2500	8.395E-03	1.739E-21

Figure 9

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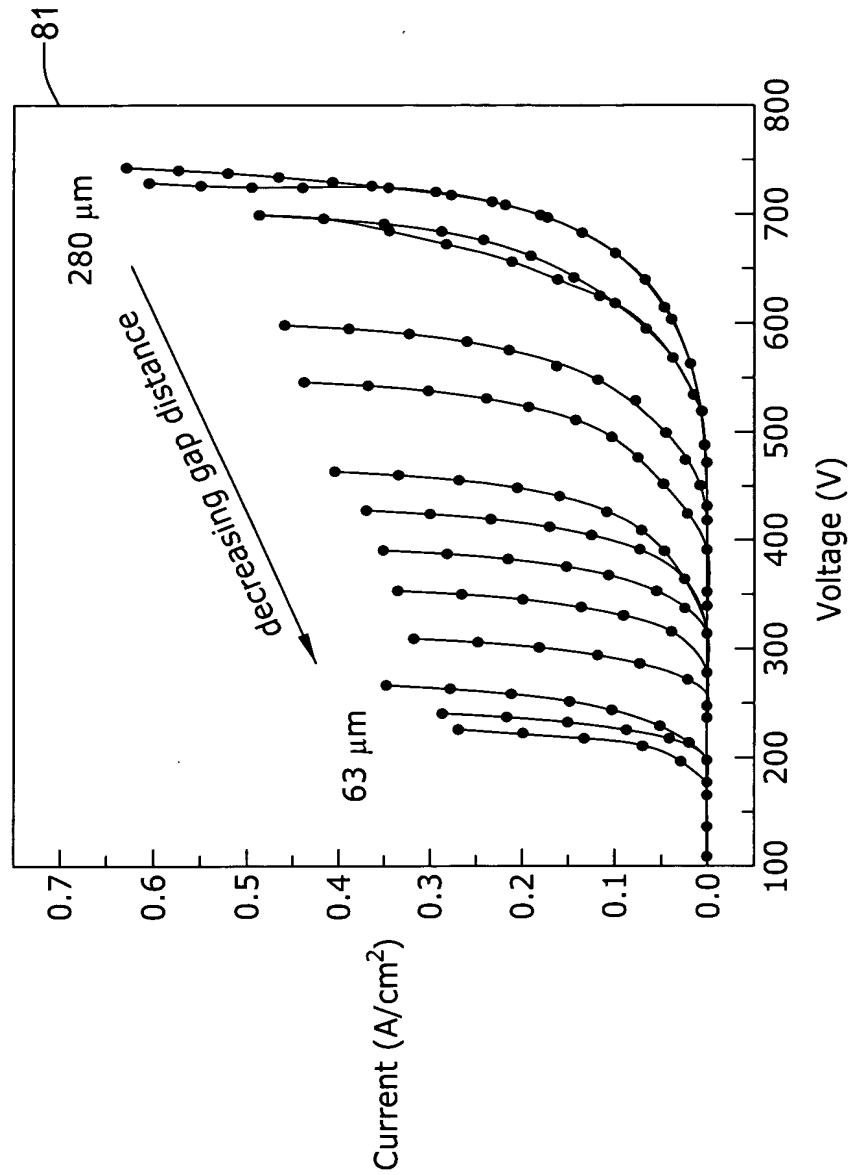


Figure 10

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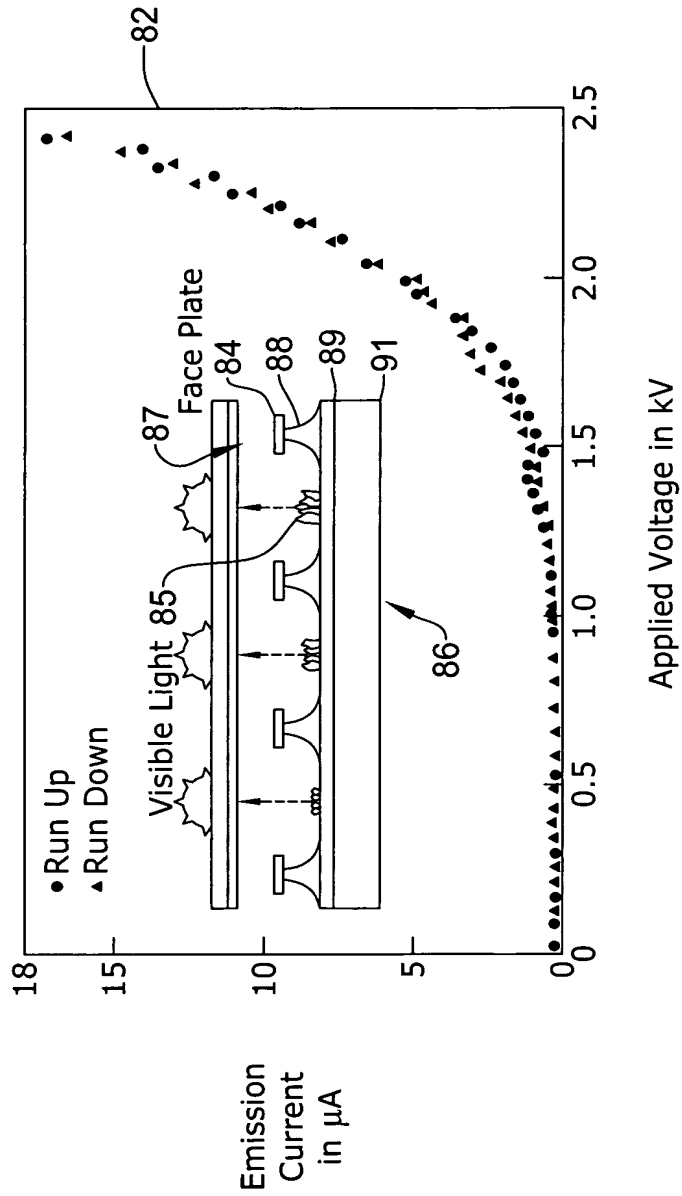


Figure 11A

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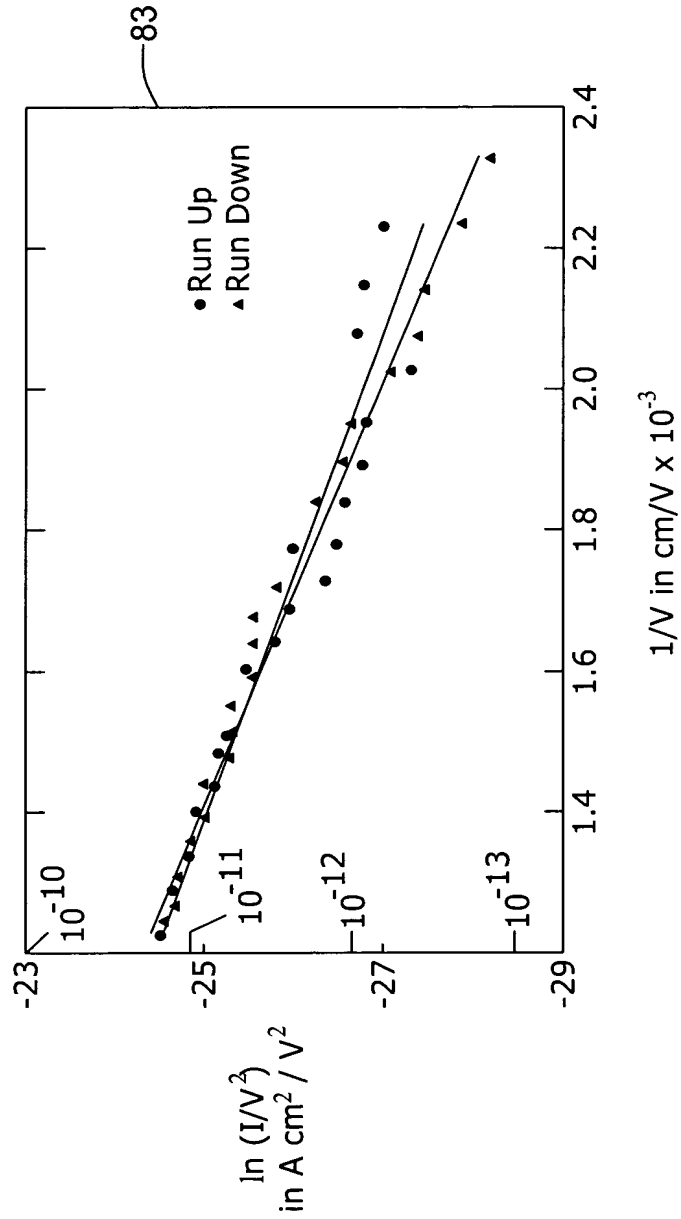


Figure 11B